ABSTRACT

The present invention provides for methods of quantitating the amounts of proteins or peptides, including those that are closely related isoforms, using matrix-assisted laser desorption/ionization time of flight mass spectrometry (MALDI-TOF-MS). Measurement of protein concentrations *in vivo* has been extremely difficult and problematic, and protein concentrations have not been shown to correlate well with mRNA levels, the standard used in the past. The present invention overcomes the deficiencies of prior methodologies by taking advantage of MALDI-TOF-MS technology and applying it to proteins and peptides in a way that allows for accurate, quantitative measurement *in vivo* of protein or peptide concentrations.